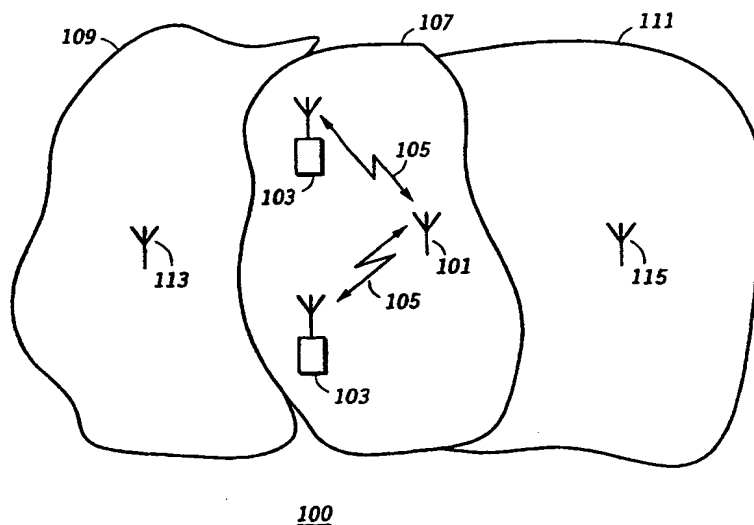


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁷ : H04Q 7/38	A1	(11) International Publication Number: WO 00/07401 (43) International Publication Date: 10 February 2000 (10.02.00)
(21) International Application Number: PCT/EP99/05352 (22) International Filing Date: 19 July 1999 (19.07.99) (30) Priority Data: 9816159.9 25 July 1998 (25.07.98) GB (71) Applicant (for all designated States except US): MOTOROLA LIMITED [GB/GB]; Viabes Industrial Estate, Basingstoke, Hampshire RG22 4PD (GB). (72) Inventors; and (75) Inventors/Applicants (for US only): AFTELAK, Andrew [GB/GB]; 54 Ivar Gardens, Lychpit, Basingstoke, Hampshire RG24 8YD (GB). ROBINSON, William [GB/GB]; 15 Wentworth Close, Weybourne, Farnham, Surrey GU9 9HH (GB). JEPSEN, Rene [DK/GB]; 5 Bancroft Close, Grange Park, Swindon, Wiltshire SN5 6HB (GB). (74) Agents: IBBOTSON, Harry et al.; Motorola European Intellectual Property Operations, Midpoint, Alencon Link, Basingstoke, Hampshire RG21 7PL (GB).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: COMMUNICATION SYSTEM AND METHOD THEREFOR**(57) Abstract**

The invention relates to a communication system (100) with a network communicating with subscriber units (103) over radio communication links (105). Dynamic system information relating to the current or predicted future status of the communication system is transmitted to the subscriber units from the base stations. The subscriber units will receive and demodulate this dynamic system information and will select a preferred value of a characteristic of the communication system in response to the information received. Specifically, the subscriber units may request the network to set a characteristic of the communication system to the preferred value or the communication between the subscriber unit and the network may be changed to the preferred value. The invention is applicable but not limited to a cellular communication system such as the Universal Mobile Telecommunication System under development.

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The communication network which performs at least one communication link with at least one subscriber unit (303) through a radio link (305) is included. It is the communication system (100) which has the property that plurality differs. The means for transmitting the dynamical-system information about the condition of communication system (100) to at least one subscriber unit (303) from said communication network, At least one subscriber unit equipped with the means for answering the means and said dynamical-system information for receiving said dynamical-system information, and choosing a value with at least one suitable property of said communication system (100) (303), Communication system characterized by having the means for setting said at least one property of communication system (100) as said suitable value of said at least one property (100).

[Claim 2] Communication system according to claim 1 said whose at least one property of communication system (100) is a property between a communication network and at least one subscriber unit (303) (100).

[Claim 3] Communication system according to claim 1 with which said means for setting said at least one property of communication system (100) as said suitable value is arranged in a subscriber unit (303) (100).

[Claim 4] Communication system according to claim 1 with which said means for setting up said at least one property of communication system (100) is arranged in a network (100).

[Claim 5] Communication system according to claim 1 with which broadcast of said dynamical-system information is carried out to all subscriber units (303) (100).

[Claim 6] Communication system according to claim 1 with which said dynamical-system information is transmitted to a specific group's subscriber unit (303) (100).

[Claim 7] Communication system according to claim 1 with which said dynamical-system information is transmitted to an individual subscriber unit (303) (100).

[Claim 8] Said dynamical-system information transmitted The next group : a) Traffic load b) Resource allocation c) Traffic mix d) The location of a subscriber unit (303) e) Within a system, capacity of a subscriber unit (303) in use f) Network capacity g) A network available resource h) Tariff i) A service provider's availability a j service provider's capacity Availability of k communication system Capacity of communication system besides l m — communication system (100) including the property chosen from available service according to claim 1.

[Claim 9] Said at least one property of communication system (100) is the next group. : Time amount of a communication link b communication link demand Priority of c communication link d communication link format e data transfer rate f service provider g communication system h service Communication system according to claim 1 chosen from i handover (100).

[Claim 10] Communication system according to claim 1 with which the subscriber unit (303) is further equipped with the means for showing a user said dynamical-system information (100).

[Claim 11] Communication system according to claim 1 with which it has further a means for a subscriber unit (303) to receive a user's input, and at least one property of the communication link between a subscriber unit and a network answers this user input, and is determined as it (100).

[Claim 12] Communication system according to claim 1 further equipped with the means for a subscriber unit (303) to transmit said dynamical-system information to an external device (303) (100).

[Claim 13] Communication system according to claim 1 with which it has further a means for a subscriber unit (303) to receive the input from an external device (303), and at least one property of communication system (100) answers this input from an external device (309), and is determined as it (100).

[Claim 14] Communication system according to claim 12 or 13 said whose external device is a smart card (100).

[Claim 15] Means for requiring that a subscriber unit (303) should change at least one property of communication system (100) into a network Communication system according to claim 1 further equipped with the means for a network answering said demand and changing said at least one property of communication system (100).

[Claim 16] Communication system according to claim 15 with which distribution of a resource are changed (100).

[Claim 17] Communication system according to claim 16 which communication system (100) uses a code division multiple access standard, and is changed when distribution of a resource change allocation of the distributed sign between base stations (100).

[Claim 18] Communication system according to claim 16 which communication system (100) uses a Frequency-Division-Multiple-Access method, and is changed when distribution of a resource change the radio frequency assignment between base stations (100).

[Claim 19] Communication system according to claim 1 whose communication system (100) is cellular mobile communication system and whose subscriber unit (303) is a mobile station (100).

[Claim 20] Communication system according to claim 19 which is GSM cellular mobile communication system (100).

[Claim 21] The communication network which performs at least one communication link with at least one subscriber unit (303) through a radio link (305) is included. It is the approach of changing a communication link with the communication system (100) which has the property that plurality differs. The step which transmits the dynamical-system information about the condition of communication system (100) to at least one subscriber unit (303) from a communication network, The step which receives said dynamical-system information in said at least one subscriber unit (303), answers said dynamical-system information, and chooses a value with at least one suitable property of communication system (100), The approach characterized by including the step which sets said at least one property of communication system (303) as said suitable value of said at least one property.

[Claim 22] The method of changing a communication link with communication system (100) according to claim 21 that broadcast of said dynamical-system information is carried out to a subscriber unit (203).

[Claim 23] Said dynamical-system information transmitted The next group : a) Traffic load b) Resource allocation c) Traffic mix d) The location of a subscriber unit (303) e) Within a system, capacity of a subscriber unit in use f) Network capacity g) A network available resource h) Tariff i) A service provider's availability a j service provider's capacity Availability of k communication system Capacity of communication system besides l m — method including the property chosen from available service of changing a communication link with communication system (100) according to claim 21.

[Claim 24] Said at least one property of communication system is the next group. : Time amount of a communication link b communication link demand Priority of c communication link d communication link format e data transfer rate f service provider g communication system h service Method of changing a communication link with communication system (100) according to claim 21 chosen from i handover.

[Claim 25] The approach of containing further the step which transmits said dynamical-system information to an external device (309) of changing a communication link with communication system (100) according to claim 21.

[Translation done.]

*** NOTICES ***

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

(Field of the Invention)

This invention relates to the communication system equipped with the network which communicates with a subscriber unit through a radio channel. Although this invention is applicable to cellular communication system, such as general-purpose migration communication system (UMTS) in the process of a ***** digital mobile telephone (GSM) or a current standardization, it is not limited to them.

[0001]

(Prior art)

Generally in cellular migration communication system, each subscriber unit communicates with a fixed base station. The communication link to a base station from a subscriber unit is known as an up link, and the communication link to a subscriber unit from a base station is known as a down link. All the coverage area of a system is divided into a cel with separate a large number by which each is covered by the single base station. Generally a cel can be distinguished geographically and includes the coverage area which laps with the adjoining cel. If a subscriber unit moves to the coverage area of another cel from the coverage area of one cel, a communication link will change from between a subscriber unit and the base stations of the 1st cel to between a subscriber unit and the base station of the 2nd cel. This is known as a handover. Some especially cels may exist in the coverage of other larger cels completely.

[0002]

All base stations interconnect by the network. This network contains various control units and the base station itself for employing a communication line, the interface to other communication networks, and a network. As for the call from a subscriber unit, a network is sent to a destination specific to the call of a through lever. When a call is a call between two subscriber units of the same communication system, a call lets a network pass and is sent to the base station of the cel in which other subscriber units are carrying out the current position. In this way, connection is established between two actuation cels through a network. In alternative, when a call is a call between the telephones connected to a subscriber unit and Public Switched Telephone Networks (PSTN), a call is sent to the interface between cellular migration communication system and PSTN from an actuation base station. Subsequently, it is sent to telephone by PSTN from an interface.

[0003]

Cellular migration communication system can assign the frequency spectrum for the radio between a subscriber unit and a base station. This spectrum must distribute a system among the subscribers who use it for coincidence. In GSM and the same system, this is attained by dividing a spectrum into many frequency channels. In GSM, each frequency channel is further divided into eight distinguishable time slots. By assigning a time slot to a subscriber unit during each use, the subscriber unit of 8 ** can be supplied with service by eight frequency channels. Many frequency channels are assigned to each cel. Since the number of frequency channels is restricted, generally the same frequency channel is assigned to the above two cels. This is known as frequency reuse, and if the frequency reuse is dense, as the same frequency channels

will gather in near a certain forge fire that is, the traffic carrying capacity which can attain a system becomes higher.

[0004]

Efficient use of the limited resource becomes still more important as the need of wireless mobile communication increases. While the need for various data services increases importance in addition to it, it is imagined that service is diversified further. It has the intention of the general-purpose migration communication system (UMTS) under development so that the changing data transfer rate and delay, and the service from which many containing the data service of an error rate differ may be offered. It is expected that this system is used for very various applications containing both also in the application of a low priority of a non-time amount constraint mold with the application of the time amount constraint mold of the high priority which requires instant high-speed resource allocation.

[0005]

Generally a current system performs static resource allocation, and an available resource is assigned to a base station for a long time. If a communication link is required from a subscriber unit, it will require the resource from a network. If there is an available thing, it will be assigned to a subscriber unit and it will continue a call. However, without an available resource, a call is intercepted and cannot continue.

[0006]

With future migration communication system, the resource request will be substantially changed as a result of various services. In order to secure a blocking rate low enough, the high resource allocation for which each base station is used only during a peak load period is needed. The low resource allocation to a base station produces a blocking rate high as a result, therefore service to a user falls.

[0007]

Therefore, remarkable profits can be obtained from the fall of fluctuation of a resource request.

[0008]

(Outline of invention)

This invention reduces resource fluctuation with the communication system equipped with the network which communicates with a subscriber unit, and it strives for it to offer the system for offering better user service.

[0009]

This invention follows like the 1st voice and at least one subscriber unit and communication system including the communication network which performs at least one communication link are offered through a radio link. This communication system includes the means for having two or more various properties, and transmitting the dynamical-system information relevant to the condition of communication system to said at least one subscriber unit from a communication network. Said at least one subscriber unit includes the means for receiving said dynamical-system information, the means for answering said dynamical-system information and choosing a value with at least one suitable property of communication system, and the means for setting said at least one property of communication system as said suitable value of said at least one property.

[0010]

As for dynamical-system information, it is desirable that broadcast is carried out to a subscriber unit, and more than one or it of the following parameter is included.

[0011]

a) A traffic load b) Resource allocation c) Traffic mix d) The location of a subscriber unit e) Within a system, capacity of a subscriber unit in use f) Network capacity g) A network available resource h) Tariff i) A service provider's availability a j service provider's capacity Availability of k communication system Capacity of communication system besides l m -- available service As for a subscriber unit, it is desirable to change communicative time amount, a communication link demand, or a communication link format.

[0012]

According to the suitable description of this invention, a subscriber unit includes the means for showing a user or an external device dynamical-system information, and receiving an input from a user or an external device.

[0013]

A network includes the means for answering said demand and making an operating characteristic change including the means for requiring that a subscriber unit should change the operating characteristic of communication system into a network further according to the different suitable description.

[0014]

This invention follows like the 2nd voice and at least one subscriber unit and the method of changing a communication link with communication system including the communication network which performs at least one communication link are offered through a radio link. This communication system has the property that plurality differs. Said approach The step which transmits the dynamical-system information relevant to the condition of communication system to said at least one subscriber unit from a communication network, The step which receives said dynamical-system information, and the step which answers said dynamical-system information in said at least one subscriber unit, and chooses a value with at least one suitable property of communication system, It characterizes by including the step which sets said at least one property of communication system as said suitable value of said at least one property.

[0015]

It explains below, referring to an attached drawing as a mere example about the operation gestalt of this invention.

[0016]

(Explanation of a suitable example)

Drawing 1 shows the cellular communication system 100. Within a system, a base station 100 communicates with many subscriber units 103 through the radio link 105. With an above-mentioned operation gestalt, the subscriber unit 103 is specifically a mobile station. In a cellular system, a base station 101 covers the user in the specific geographical region 107, and other geographical regions 109 and 111 are covered by other base stations 113 and 115. Generally in addition to a broadcast subcarrier, each of base stations 101, 113, and 115 contains one or the traffic subcarrier beyond it. It is indiscriminately transmitted to all mobiles and **** reception of the broadcast transmission can be carried out at all the mobiles in coverage area.

[0017]

With the operation gestalt of this invention, broadcast of the dynamical-system information about the current condition of communication system is continuously carried out from a base station to all subscriber units. A subscriber unit controls the element of that communication link by received information which received this dynamic information and restored. Broadcast of the future condition that communication system is predicted with it instead of the present condition can also be carried out in alternative.

[0018]

As a specific example, the tariff of service can change with the traffic loads of a system dynamically. Therefore, service will become more expensive than the inside of the low loading which remains without using a resource during the heavy load period. A load can be changed continuously, and a tariff can be related to momentary load, therefore it can also change continuously. Broadcast of the current tariff is carried out to all subscriber units, therefore each subscriber unit acquires the information about the current tariff of service. By how much a communication link is a time amount constraint mold, a subscriber unit can choose delaying a communication link until a tariff becomes lower than a specific threshold, or corrects it immediately, and it is high costs and can choose transmitting.

[0019]

In most situations, the present traffic mix of mobile communication system is changed, and contains both the user of a time amount constraint mold application, and the user of the

application of a non-time amount constraint mold. With an above-mentioned operation gestalt, since the tariff in a peak period becomes high, many subscriber units shift the communication link at the period of the rate for low interest and blocking of the time amount constraint mold communication link during a peak period is prevented by it, fluctuation of an accumulation resource request falls.

[0020]

For example, as for outside hours, in contrast with the static definition of the peak and off-peak period when a fall tariff is introduced, the above-mentioned operation gestalt of this invention fits a traffic mix dynamically to an available resource. Consequently, more flexible use of a resource is obtained and delay of an unimportant communication link becomes short substantially.

[0021]

According to another operation gestalt of this invention, the dynamical-system information transmitted includes current resource allocation. In code division multiple access (CDMA) communication system, a subscriber unit uses the same frequency spectrum and it is discriminated from it by the diffusion sign assigned to the subscriber unit. Many diffusion signs are assigned to each base station in CDMA systems, such as UMTS in the process of a standardization. Therefore, a base station has the diffusion sign of the assigned maximum number, and this restricts the number of the maximum users in the minimum data transfer rate of each base station. Two or more diffusion signs are assigned to the user who transmits with a higher data transfer rate, or the sign of a more [in alternative] low diffusion coefficient can be assigned to him.

[0022]

Drawing 2 shows the tree 200 of a sign. Each wooden perpendicular branching corresponds to the diffusion sign which can be assigned. If the die length of each diffusion sign falls by one step, it will double the stairway of a wooden perpendicular direction. About a predetermined diffusion sign, it connects with perpendicular branching of a subordination sign, i.e., a predetermined sign, and depends, and low branching does not intersect perpendicularly to a parent sign. Therefore, if a predetermined sign is assigned, it is fully inseparable with a subordination sign. In the example of drawing 2, if a sign 1 is assigned to a high-speed subscriber unit, use of a sign 3 and a sign 4 will be prevented. Therefore, in the case of the multi-rate CDMA system mentioned above, the tree 200 of the present sign in which it is shown which which sign is used and is not used can be included in dynamical-system information.

[0023]

Probably, it will be clear to this contractor how dynamical-system information is transmitted and received by the subscriber unit. It is transmitted, for example by the separate frequency channel, and, specifically, can attain being based on the information which time-multiplexing is carried out to other transmission from a base station, or can assign a separate diffusion sign by the code division multiple access system etc. by the approach same with a control channel being transmitted with the present cellular system.

[0024]

As for the means for determining and changing a communicative property, it is desirable to realize as a software program performed on suitable processors, such as a micro controller or a digital signal processor. In order [which should be transmitted later] to come and to put data into a buffer, it is desirable to include a memory unit.

[0025]

The dynamical-system information transmitted by the base station changes with implementation of the communication system which uses this invention. It can be made into an easy tariff like [in the case of the operation gestalt shown upwards], or can also include the detailed information about many side faces of the condition of communication system. The following is contained as a concrete example of the information which can be included in the dynamical-system information transmitted.

a) Traffic load. A network can transmit the information on the network present load. Concretely,

this information can be shown as the percentage of all the resources used now, or the number of users present in use.

b) Resource allocation. The information about how the available resource is assigned can be included in dynamical-system information. Concretely, the information about an available resource can be transmitted to a subscriber unit in the base station according to each. In the case of a CDMA system, it is desirable to carry out by including the tree 200 of a sign in dynamical-system information as this mentioned above. As for this, in the case of Frequency Division Multiple Access (FDMA) or a time division multiple access (TDMA) system, it is desirable to attain by including the information about which time slot and frequency are occupied.

c) Traffic mix. The subscriber unit of a difficult problem can be using a base station, and the information about which service they use now and the present traffic mix can be transmitted.

d) The location of a subscriber unit. The information about the location of the mobile which has accessed the network including the information about the number of the subscriber units in various cels can be transmitted. The subscriber unit which expects access of a network accesses the cel which is the general usually nearest base station and which operates best. however, while many subscriber units are in this cel, when it obtains when there were very few subscriber units located in a contiguity cel and information is received, it can choose accessing this cel instead of the cel which operates best.

e) It is the capacity of a subscriber unit in use within a system. With the communication system which offers the service from which a large number differ, a different subscriber unit can have different capacity for UMTS etc. Therefore, although supporting transmission of a low data transfer rate can only do some subscriber units, other subscriber units can also support the service of a high data transfer rate which consumes more resources. This information can be included in the dynamical-system information to which it is transmitted by the subscriber unit.

f) Network capacity. A network can have different capacity for a different base station which similarly has different capacity. Although the base station of the 1st cel can support a high data transfer rate, an adjoining base station is in the situation that it is not made, and a subscriber unit can answer this information and can determine which base station can satisfy the present need.

g) Network available resource. A network also has the resource restricted in addition to the limit imposed on the radio between a subscriber unit and a base station by the restricted available frequency band. As one example, there is buffering capacity for the data service which does not require emergency. A subscriber unit can answer a resource available now and can make a communication link change by delaying transmission by including this information until the buffer for example, in a network fully becomes empty and it can put now the whole block of data which is going to transmit into a buffer.

h) A service provider's availability and capacity. Generally in mobile communication system, such as a GSM system, various service providers who use the same communication system exist. These service providers can provide a user with various services, and can include the information about which service provider offers which service in which area now in dynamical-system information. For example, since the resource is used by other subscriber units, in the situation that one service provider cannot offer service of a high data transfer rate, a subscriber unit can answer this information and this service can switch it to another service PUROBUA inductance available now.

Availability and capacity of communication system besides i). Predetermined area is often covered by two or more communication system. Therefore, the subscriber unit related with two or more communication system can choose which communication system is used. Some communication system which is expected to UMTS and GSM constitutes partner communication system, and specifically, the subscriber unit is possible for it there, only by being able to perform a handover and the coverage of some area letting one of the systems pass between two systems. DCS which operates by 1800MHz although it corresponds to GSM and GSM which operate for example, by 900MHs as another example has the system which uses a

different frequency band. The information about other availability and capacity of communication system can be included in the dynamical-system information to which it is transmitted by the base station. It can be used in case it determines which communication link a subscriber unit performs for this with which communication system shortly.

j) Available service. The service which can be supported by the network may be changed only by change of a traffic load and a traffic mix also for change of the network itself. As one example, a network component is in a non-operative condition because of maintenance or repair, therefore only service of the group to which the network was restricted may be able to be offered. Available service may be changed between the parts from which a network differs for the capacity from which the transmission link which connects a network component differs further. The information about service available now can be included in the dynamical-system information transmitted in specific area. A subscriber unit can answer it, can change the communication link demand, and can be fitted to available service.

[0026]

Many properties of the communication link from a subscriber unit can be made to change. These contain the following.

a) Communicative time amount. A subscriber unit can delay communicative time amount until a condition becomes suitable, as mentioned above. As for a subscriber unit, it is desirable to delay a communication link until a tariff becomes low enough, and it can use suitable service or a traffic load becomes low.

b) Communication link demand. With some operation gestalten, a subscriber unit can answer the received dynamical-system information, and can change an actual communication link demand. When transmitting the 1-block data showing an image as a specific example, a subscriber unit can transmit the low quality copy compressed into altitude, when a tariff is high now, but when a tariff is present very low, it can transmit an incompressible high quality copy.

c) Communicative priority. According to this operation gestalt, a subscriber unit answers the received information and changes communicative priority. When the information that a subscriber unit has some communication link demands, and can use only service of the specification in a specific period for dynamical-system information as an example is included, the communication link which requires this service has priority higher than the communication link which does not require this service.

d) Communication link format. A subscriber unit can answer the received dynamical-system information, and can change a communicative property. The information that the base station which offers service can have the resource with which most amount is not used, and can assign it temporarily to a subscriber unit at very slight costs as an example may be received. A subscriber unit can change the modulation technique to be used into a low effectiveness method from a band efficient modulation technique, and can bring about the error rate engine performance by which this has been improved shortly, therefore can reduce the transmitted power of a subscriber unit. the dynamical-system information transmitted when it is required that other subscriber units should assign a resource to a base station -- this -- it can include -- a subscriber unit -- more -- bandwidth -- it can return to an efficient modulation technique.

As other properties which can be changed, there is an amount (for example, training sequence) of advance error correcting system, interleaving, and the known data contained in transmission.

e) Data transfer rate. A subscriber unit can answer the received dynamical-system information, and can change an information rate. Speech compression can be changed depending on the case of voice communication, for example, the various present costs of a data transfer rate. At the higher time of costs, more, it follows, a low data transfer rate is used more, and it can perform high compression and using low compression from that of high quality more at the lower time of costs. In this way, a data transfer rate and quality answer the received dynamical-system information, and are changed, and the costs fixed comparatively as a result are brought about.

f) Service provider. A service provider can be changed when giving [which a subscriber unit answers dynamical-system information according to this operation gestalt, for example, he

wishes] is not offered by the present service provider. g) Communication system. Similarly, a subscriber unit can be changed into different communication system when the service which answers dynamical-system information, for example, he wishes is not offered by the present communication system.

h) Service. According to this operation gestalt, a subscriber unit answers the received dynamical-system information, and changes service. As an example, the information on the increment in costs of service of a high data transfer rate is answered more, and a communication link may be changed into the voice communication of a lower data transfer rate from pictorial communication.

j) Handover. A mobile can answer the received dynamical-system information and can perform a handover. The information that an adjoining base station can support as an example the service which cannot support an actuation base station may be included in dynamical-system information. In order to use this service in this case, the handover of the subscriber unit can be carried out to an adjoining base station.

[0027]

With another operation gestalt, broadcast of the dynamical-system information is indiscriminately carried out to not all subscriber units, but it is transmitted to a specific group's subscriber unit. Specifically, different system information can be transmitted to a different group's subscriber unit. As an example, cellular communication system can contain various user categories with various subscribers tariff and various services. The current availability and the costs of specific service are only transmitted to the subscriber unit in a suitable category.

[0028]

With a somewhat different operation gestalt, dynamical-system information targets each individual subscriber unit specifically so that the specific tariff for providing a subscriber unit with various services may be directly notified to each subscriber unit, taking the user category of the user of the capacity of a current traffic load, an available resource, a base station, and a specific subscriber unit, and a specific subscriber unit into consideration.

[0029]

With a different operation gestalt, a subscriber unit can include the means for showing the user of a subscriber unit the received system information. It is desirable to show the display on a subscriber unit information in a text or a suitable graphic form format. Information shown can be made into the property drawn from a part of all received information, received information, or the received information.

[0030]

With another operation gestalt, a subscriber unit obtains a user's input and includes the means for choosing a value with the suitable property of communication system by taking this information into consideration. As a concrete example, the keypad on a subscriber unit may be used and the maximum price of service may be inputted. Subsequently, since a subscriber unit receives the dynamic information about the present costs to a predetermined data transfer rate, it can choose the maximum data transfer rate below this value. With this operation gestalt, a communication link is changed in this way, taking into consideration both inputs of the dynamical-system information and the user who received.

[0031]

According to the operation gestalt from which this invention differs, a subscriber unit includes the means for communicating with external equipment functionally or physically, as shown in drawing 3. Dynamical-system information is transmitted to the subscriber unit 303 through the radio channel 305 from a base station 301. With this operation gestalt, information is transmitted to an external device 309 through a communication link 307.

[0032]

Although an external device can be used as the equipment of the arbitration which is not the one-part of a subscriber unit in principle, it is desirable that they are a computer or an electronic organizer (for example, personal digital assistant-PDA). In alternative, an external device can be made into a smart card and, in the case of cellular systems, such as GSM, can be

especially used as the SIM (subscriber identity module) card used in order to hold subscriber information to these systems.

[0033]

Although it is desirable that it is restraining cable connection with the suitable interface built into the subscriber unit and the external device as for a communication link 307, communication links where others of arbitration are known, such as ultraviolet rays or a radio link, can be used for it.

[0034]

Information transmitted in a communication link 307 can be made into the property drawn from a part of information which the received dynamical-system information all received, or the received information.

[0035]

According to a different operation gestalt, a subscriber unit receives an input from an external device, and includes the means for choosing a value with the suitable property of communication system by taking this input into consideration. An example is the system shown in drawing 3, and a communication link 307 is a two-way communication link here. In this example, an external device can receive dynamical-system information through a communication link, can process information, and can provide a subscriber unit with an input through the same communication link 307.

[0036]

According to a different operation gestalt, a subscriber unit can answer the received dynamical-system information, a value with the suitable property of communication system can be chosen, and a network can be required to change a property according to it. With this operation gestalt, although a mobile station determines a value with a suitable property, control of the real value of a property remains in a network. As for a subscriber unit, it is desirable that a network can be required to change resource allocation. Concretely, a network can answer a demand from a subscriber unit and can change the resource allocation between base stations or between subscribers. In the case of the former, this is attained by the FDMA system by assigning more frequencies in more diffusion signs in a CDMA system in the base station demanded by the subscriber unit. If the new subscriber unit which has the preparation which pays a higher tariff in the case of the latter requires this, networks can decrease in number the resource already assigned to the subscriber unit in use.

[0037]

Probably, it will be clear to this contractor for it to be able to apply to other communication system with which this invention is not limited to cellular migration communication system, but contains a wireless local loop system or a satellite communication system.

[Brief Description of the Drawings]

[Drawing 1]

Drawing 1 is the illustration of the cellular communication system which can apply this invention.

[Drawing 2]

It is the tree of the sign used with code division multiple access communication system, such as UMTS.

[Drawing 3]

A subscriber unit is the block diagram of the operation gestalt of this invention connected to the external device.

[Translation done.]